

Topical Anesthesia in Sinus Operations.—In a discussion on the technique of operations for perinasal sinusitis, SIEBENMANN (*Annales des Maladies de l'Oreille, du Lar., du Nez et du Pharynx*, January, 1913) affirmed that local anesthesia predisposes to local suppuration, and impedes cure by first intention. Ritter reported that he had had a case of death seven hours after an operation as a result of anesthesia by morphine-scopolamin injection.

HYGIENE AND PUBLIC HEALTH

UNDER THE CHARGE OF

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Chlorinated Lime in Sanitation.—Chlorinated lime or bleaching powder, popularly miscalled "chloride of lime," is a very remarkable substance which is being used very widely, especially for the disinfection of drinking-water supplies. The subject is summed up in a book entitled *Chloride of Lime in Sanitation*, by ALBERT H. HOOKER (John Wiley & Sons, 1913). Ballard, in 1835, found chlorinated lime to be composed of: Calcium hypochlorate, $\text{Ca}(\text{OCl})_2$; calcium chloride, CaCl_2 ; calcium hydroxide, $\text{Ca}(\text{OH})_2$. Subsequent investigations by Olding and other chemists have shown that calcium chloride and calcium hypochlorite do not exist as such in dry bleaching powder, but are found on dissolving it in water. Calcium oxychloride, CaOCl_2 , is generally accepted to be the essential constituent of dry chlorinated lime, and calcium hypochlorite to be the active principle of the solution. It is also now well understood that chlorinated lime in its industrial application of bleaching, deodorizing, or disinfecting does not act by its chlorine, but by its oxygen. The chemical action is not "chlorination" but "oxidation." Hypochlorous acid (HOCl) is probably the most powerful oxidizing agent known to chemists, and is readily broken up into hydrochloric acid, and liberates nascent oxygen with extreme readiness. Hooker gives convenient methods for making standard solutions of chlorinated lime, with useful tables, comparing parts per million with grains per gallon, expressed in terms of bleach and in terms of available chlorine. As a practical process the use of chlorinated lime for the disinfection of water dates from 1908, when Mr. G. A. Johnson was called to remedy some serious trouble in the water purification at the Chicago stock yards. Filtration of the water of Bubbly Creek was not satisfactory, and Mr. Johnson substituted chlorinated lime for the copper sulphate which had been used. Chlorinated lime is now used by many municipalities to render their public water supply safe. In some places it is used in

conjunction with alum coagulation and sedimentation or slow sand filtration; in fact, it may be used either alone or as an accessory to other methods. Following is a partial list of cities now using hypochlorite of lime in their drinking water supplies: New York, 16 pounds per million gallons; Omaha, $7\frac{1}{2}$ pounds per million gallons after coagulation and sedimentation; Cincinnati, 5 to $12\frac{1}{2}$ pounds—typhoid rate reduced to 5.7; St. Louis; Minneapolis, after mechanical filtration; Toronto, 6 pounds; Montreal, 5 to $7\frac{1}{2}$ pounds; Cleveland, 16 pounds; Erie, 7 to 10 pounds; Chicago; Milwaukee, 6 pounds; Pittsburgh, 3 pounds, after slow sand filtration; Jersey City, 5 to 8 pounds; Council Bluffs, 15 pounds, following alum precipitation; Brainerd, Minn.; Ridgeway, N. J.; Corning, N. Y.; Nashville, Tenn., 14 pounds; Grand Rapids, Mich.; Little Falls, N. J.; Harrisburg, Pa.; Baltimore, Md.; Niagara Falls; Toronto; Ottumwa, Iowa, and others. It is important to remember that in waters treated with chlorinated lime, free chlorine never is present. While the chlorinated lime kills bacteria in the amounts used, it does not purify organic matter, cure discoloration, turbidity, or neutralize tastes and odors in the water. The remarkable germicidal power of chlorinated lime is better understood when it is known that three grains of a practically harmless substance will kill myriads of bacteria contained in a barrel of water. Ordinarily the amounts used are from one to two or five parts per million parts of water. Much more is required in sewage. A bacterial reduction of 99 per cent. may be obtained in a water containing little organic matter, with one part per million, whereas it requires 1 part to 25,000 parts of sewage to affect a similar bacterial reduction. In practice, the average amount of bleach used in water purification is from 5 to 12 pounds per million gallons of water. The bleach cannot be detected by the sense of taste, provided the amount does not exceed 25 pounds. While the chlorinated lime treatment of water supplies is essentially simple, yet it requires able professional supervision else disappointing results will come from haphazard work. The great essential is a uniform dosing of a standard solution. Bleaching powder is also used in the disinfection of the water of swimming pools, for street sprinkling, and flushing, for the disinfection of feces and sputum; and to a certain extent, for the disinfection of glassware, fabrics, brushes, and combs. It is one of the best substances we have for the general disinfection of rough places, such as slaughter-houses, bake-houses, dairies, outhouses, cellars, and the like. In surgery chlorinated soda is used, the action of which is entirely analogous to chlorinated lime.

The Stable Fly as a Carrier of Disease.—SCHUBERG and KUHN (*Arbeiten a. d. Kaiserl. Ges.-Amt.*, 1912, xl, No. 2) have studied the question of the transmission of various infections, particularly relapsing fever, anthrax, Southwest African horse sickness (*Pferdesterbe*), and epithelioma of fowls (*Hühnerpocken*) through the agency of the stable fly (*Stomoxys calcitrans*). The first report of these studies was published a year ago (*Arbeiten a. d. Kaiserl. Ges.-Amt.*, 1911, xxxi, No. 2) with special reference to trypanosomes and spirochetes. The successful results obtained by Schuberg and Kuhn now have an added significance in view of the recent findings which incriminate the stable